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Lynda Deschambault
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Dear Lynda:

The USDA Forest Service appreciates the opportunity to comment on Atlantic Richfield Company's March 31, 2016 Draft *Focused Feasibility Study Revegetation Treatability Study Work Plan* for the Leviathan Mine Site. Although the test plots described in this plan are wholly located on land administered by the Lahontan Regional Water Quality Control Board, implications from these strategies may migrate to the adjacent National Forest System lands, so it is for this reason we feel compelled to comment.

This plan presents a passive approach to reducing surface water from entering the contaminant zone where acid mine drainage is created while also attenuating the flux of water already present in the subsurface. The Forest Service fully supports all effective long-term passive treatment solutions to the very complex problem of water balance at the site. However, the Forest Service believes that several components of the revegetation pilot studies as described by Atlantic Richfield warrant further discussion as they contradict several objectives that the Forest Service adheres to when evaluating revegetation efforts.

Specifically, the following general principles of the plan should be revisited:

- Use of non-native seed mixture (accession seeding strategies). The use of "accession" in the context of the reviewed document is confusing. The word accession is typically used to describe a seed source being developed for a commercial product. Specifically, it is used when increasing the amount (the very definition of accession) of seed from a wildland collected source. If however, the writer of the proposal is trying to describe the use of a plant species as a place holder until a healthy, self-sustaining, native community can establish itself then perhaps the more appropriate phrase "successive strategy" should be used. This would adequately describe the basic principles of plant ecology where the communities change over time starting at disturbance and develop through early, middle, and late seral stages. If this is the case, then the use of a "place-holder" species could be referred to as a surrogate or, more commonly, a "nurse crop". This would eliminate confusion and would be technically accepted.
- FS Manual guidance 2070 states that Native plant materials will be the first choice in revegetation for restoration and rehabilitation of native ecosystems where timely natural regeneration of the native plant community will not occur. Recognizing the need to

maintain native plant communities as part of fully functioning ecosystems, the Forest Service promotes the use of native plants in revegetation projects on National Forest System lands. This policy is designed to help combat invasive species, mitigate impacts of climate change, and maintain healthy forests.

- Test plots have not been selected to depict the varying topographic conditions present throughout the projected area under consideration.
- Agronomic parameter testing is suggested, but a map depicting these locations is missing. The proper mixture of soil amendments relies on site specific parameters. It is imperative to mix to at least a 3-foot depth wherever possible to provide nutrients to deep roots.
- Test plots will not be populated with deep-rooting species (container plants) because seeding is deemed more effective to promoting vegetative cover. This approach conflicts with the desire to achieve deep-root penetration and attenuate water flux through the site. If the study fails, more specifically if the seeding fails, there would be a broad range of plausible explanations. If a few containerized, deep rooting plants were added to the study plots and if they successfully established, then one could reasonably deduce that the condition created would feasibly support deep rooting species independent of seeding success.
- Revegetation efforts usually proceed for three years to achieve monitoring requirements, not two years as proposed in this document. It is interesting that the plan's authors realize that two years is a short duration that may negatively impact the pilot's success, yet this is the proposed time frame.

The Forest Service recognizes that other agency reviews of this report identified similar cause for concern. It seems clear that revegetation efforts from the past have met mixed results; we should learn from these experiments and not neglect the most important factors for success. For a long-term treatment to be successful, it is imperative to establish proper sideboards on the pilot that properly reflect the site conditions most conducive to achieving positive results.

Sincerely,

/s/Erica Hupp (for)

WILLIAM DUNKELBERGER
Forest Supervisor